The California CABG Outcomes Reporting Program (CCORP)

Training Session
November 22, 2002

Loel Solomon, Ph.D., HQAD Deputy Director

What is the Office of Statewide Health Planning and Development (OSHPD)?

- Facilities Development
  - Seismic safety
  - Code compliance
- Cal-Mortgage
  - Facility financing
- Workforce and Community Development
  - Health professions training
  - Nursing initiative

- Healthcare Information
  - PDD, utilization, financial
  - Inpatient, ED and ASC

- Healthcare Quality and Analysis
  - Hospital outcome reports
  - Data dissemination

OSHPD's Outcome Programs

Studies Using Patient Discharge Data

- Acute Myocardial Infarction
- Community-Acquired Pneumonia
- Maternal Outcomes
- Hip Fracture

Studies Using Clinical Data

- Coronary Artery Bypass Graft (CABG) Surgery
- Intensive Care Outcomes (in validation phase)

David Carlisle, M.D., Ph.D., OSHPD Director

Who is CCORP?

- David Carlisle, M.D., Ph.D., OSHPD Director
- Loel Solomon, Ph.D., HQAD Deputy Director
- Joseph Parker, Ph.D., CCORP Director
- Denise King, CCORP Data Manager
- Anthony Steimle, M.D., Consulting Cardiologist
- CCORP Clinical Advisory Panel

CCORP Clinical Advisory Panel (CAP) Members

- Robert Brook, M.D. (Chair)
  RAND and UCLA

- Andrew Bindman, M.D.
  UCSF and S.F. General

- Ralph Brindis, M.D.
  Kaiser Northern California

- Cheryl Damberg, Ph.D.
  Pacific Business Group
  on Health

- Timothy Denton, M.D.
  Cedars Sinai

- Coyness Ennix, M.D.
  Alta Bates Medical Center

- Keith Flachsbart, M.D.
  Kaiser San Francisco

- Fred Grover, M.D.
  University of Colorado, STS

- James MacMillan, M.D.
  Valley Heart Surgeons,
  Modesto

Today's Agenda

- CCORP background and review of proposed regulations (9-9:30)
- Review data definitions (9:30-10:30)
- Break (10:30-10:45)
- Review data definitions (10:45-11:30)
- Practice vignettes (11:30-12:00)
- Break (12:00-12:15)
- Questions and answers (12:15-12:30)
- Quiz (12:30-1:00)

Goals for Today

- Provide context and rationale for the program
- Highlight major reporting requirements
- **Guidance in coding data elements**
- Provide coding practice with feedback

Why Today's Session is Important

- Reliability of data
  - Model accuracy
  - Validity of hospital and surgeon level results
- Fairness
  - Understanding and abiding by the rules
  - Prevent undercoding and overcoding of risk factors

What is CCORP?

- Established by law Oct. 10, 2001 (SB 680)
- Mandatory data reporting for all adult coronary bypass surgery
- Builds on voluntary effort (CCMRP)
- Risk-adjusted outcomes publicly reported at hospital and individual surgeon levels
  - Hospitals: annual starting in 2005
  - Surgeons: biannual starting in 2006

What is CCORP? (Cont'd)

- A Clinical Advisory Panel (CAP) to:
  - Recommend data elements
  - Review and approve risk model
  - Adjudicate physician appeals
- Risk-adjustment to account for differences in patient severity of illness (case-mix)
- Periodic auditing to ensure data integrity

Rationale for CCORP

- Limitations of the voluntary program (CCMRP)
  - Lack of data on non-participants
  - Relationship between participation status and outcomes
- Comparative quality information informs:
  - Consumer choice
  - Healthcare purchasing
  - Quality improvement by physicians and hospitals
- Salience of surgeon-level outcomes

Procedural Safeguards for California Surgeons

- Multiple data correction opportunities
- Mandatory 30-day review of ratings
- Appeals process for physicians
- CAP authority to exclude individual surgeons for "statistical or technical considerations"

Joseph Parker, Ph.D.

Director, Clinical Data Programs, Healthcare Quality
and Analysis Division, OSHPD

CCORP Regulations: Background

- CAP approval of data elements: May 17, 2002
- Consultation with stakeholders
  - **CHA, CHIA, UC Medical Directors, CASTS, BASTS,
    and individual surgeons**
- Proposed regulations published: Nov. 1
- End of public comment period: Dec. 20
- Approval of final regulations: Jan. 2003 (anticipated)

CCORP Regulations: Highlights (1)

- Hospitals designate a CCORP data contact
- Reporting Periods and Due Date
  - Two data submissions per year: reporting periods Jan 1-Jun 30 & Jul 1-Dec 31
  - Due date 90 calendar days after end of the reporting period (first due date 09/29/03)
- Submissions include <u>all</u> adult coronary bypass patients <u>discharged</u> during period
- Submissions must include signed Hospital and Surgeon certification forms

CCORP Regulations: Highlights (2)

- Approved methods of data collection
  - National Society of Thoracic Surgeons (STS) certified vendor software
  - Free CCORP Tool (phase 2 beta-testing)
  - In-house systems meeting specifications
- Method of report submission
  - Comma-separated ASCII text file on floppy or CD
  - US mail or postal courier service only

CCORP Regulations: Highlights (3)

- Report acceptance or rejection
  - Documentation completeness/accuracy criteria
  - Data file readable, correctly formatted
  - No missing values for 8 data elements (Facility ID, MRN, Surgeon Name, Isolated CABG, Date of Surgery, Date of Discharge and Discharge Status)
  - Signed certification forms included
- Late reports, extensions, and fines
  - Automatic 10-day extension: 30 days total
  - Requests for extension required
  - Late fine of $100 a day

CCORP Regulations: Highlights (4)

- Requested corrections, revisions, and verification of reported data
  - Multiple opportunities to correct data
  - Hospitals given 30 days to respond to requests
  - Confirmatory patient documentation may be requested
- Default values for invalid or missing data
  - Missing data allowed for most data elements
  - Imputation of lowest risk value prior to modeling
- Medical record audits performed onsite by independent audit firm

Program Attributes
That Ensure Data Integrity

- Hospital data abstractor training!
- Clinical consultation on coding issues
- Data error-checking and review
- Data validation using external sources
  - Medical records audit
  - OSHPD Patient Discharge Data
  - Vital statistics files for mortality

Required Data Elements (52)

- Identification and classification (11)
- Demographic risk factors (5)
- Operative risk factor (1)
- Comorbidities (11)
- Cardiac risk factors (10)
- Previous interventions (4)
- Hemodynamic status (5)
- Processes of care (5)

CCORP Data Element Definitions

- CCORP goal: Conform to STS when possible
  - STS data elements (46)
  - Modified STS elements (3)
    - Facility ID Number
    - Surgeon Name
    - Left Main Disease (% Stenosis)
  - Non-STS data elements (3)
    - Isolated CABG
    - CA Surgeon License Number
    - Hepatic Failure

CCORP Data Elements: Identification and classification

1) **Facility Identification Number (OSHPD ID)**
2) **Isolated CABG: Yes; No**
3) **Responsible Surgeon Name (3 separate fields): Last Name; First Name; Middle Initial**
4) **Responsible Surgeon CA License Number**
5) Payor
6) Medical Record Number
7) Date of Birth: mm/dd/yyyy
8) Date of Surgery: mm/dd/yyyy
9) Date of Discharge: mm/dd/yyyy
10) **Discharge Status: Alive; Dead**
11) **Date of Death: mm/dd/yyyy**

1) Facility Identification Number

The six-digit facility identification number assigned by the California Office of Statewide Health Planning and Development.

3) Responsible Surgeon Name

Responsible surgeon is the principal surgeon who performs the coronary artery bypass procedure. If a trainee performs this procedure, then the responsible surgeon is the physician responsible for supervising this procedure performed by the trainee. In situations in which the responsible surgeon cannot otherwise be determined, the responsible surgeon is the surgeon who bills for the coronary artery bypass procedure.

4) Responsible Surgeon CA License

California Physician License Number of responsible surgeon, assigned by the Medical Board of California of the Department of Consumer Affairs.

10) Discharge Status

Patient status upon discharge from the hospitalization in which surgery occurred.

10) Discharge Status (cont.)

- Death: Patient expired after admission and before leaving the hospital
- CCORP currently does not collect 30-day or operative mortality

11) Date of Death

Patient date of death

For more information

- Denise King
  CCORP Data Manager
  OSHPD
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  Additional CCORP information, including proposed
  regulations, may be found at:
  http://www.oshpd.state.ca.us/HQAD/ccorp/index.htm

Anthony Steimle, MD

- Practicing cardiologist in Northern CA
- Studied health outcomes as RWJ Clinical Scholar at
  UCLA and RAND, was member of UCLA's cardiac
  transplantation team
- Fax or e-mail your questions to Denise,
  and she'll forward them to Dr. Steimle

Risk Adjustment Variables - *Principles*

1) Use STS definitions - reduce effort
2) Clarify ambiguities - reduce variation
   - Ask STS
   - Survey Current Use
   - See What's Predictive
   - Operationalize

CCORP Data Elements:
Risk Factors and Processes of Care

- Identification and classification: Isolated CABG
- Demographic
- Operative
- Comorbidities
- Cardiac
- Previous Interventions
- Hemodynamic status
- Processes of Care

General Points

- Collect *pre-operative* data
- Confirm diagnoses, don't make them

2) Isolated CABG

- Answer 'No' if any of the procedures listed in section A was performed during coronary artery bypass graft surgery.

- When any of the procedures listed in section A is performed concurrently with coronary artery bypass surgery the case will be considered non-isolated and the item answered 'No'. It is not possible to list all procedures because cases can be complex and clinical definitions are not always precise. Only cardiac procedures have been listed. When in doubt, the data abstractor should first seek an opinion from the responsible surgeon and then consult CCORP.

2) Isolated CABG (cont.)

Section A
- Valve procedures
- Operations on structures adjacent to heart valves (papillary muscle, chordae tendineae, traebeculae carneae cordis, annuloplasty, infundibulectomy)
- Ventriculectomy
- Repair of atrial and ventricular septa
- Excision of aneurysm of heart
- Head and neck, intracranial endarterectomy - eg carotid endarterectomy

- Other open heart surgeries, such as aortic arch repair, pulmonary endarterectomy
- Endarterectomy of aorta
- Thoracic endarterectomy (endarterectomy on an artery outside the heart)
- Heart transplantation
- Repair of certain congenital cardiac anomalies (e.g., tetralology of fallot, atrial septal defect (ASD), ventricular septal defect (VSD), valvular abnormality)

2) Isolated CABG (cont.)

Section A (cont.)
- Implantation of cardiomyostimu-lation system (Note: Refers to cardiomyoplasty systems only, not other heart-assist systems such as pacemakers or internal cardiac defibrillators)
- Any aortic aneurysm repair (abdominal or thoracic)
- Aorta-subclavian-carotid bypass
- Aorta-renal bypass
- Aorta-iliac-femoral bypass
- Caval-pulmonary artery anastomosis

- Extracranial-intracranial (EC-IC) vascular bypass
- Coronary artery fistula
- Maze procedures
- Lung resection (partial or complete)

2) Isolated CABG (cont.)

If a procedure listed in section B is performed concurrently with the coronary artery bypass surgery, the case will be considered an isolated CABG and the data element coded 'Yes', unless a procedure listed in section A is performed during the same surgery. These particular procedures are listed because the Office has received frequent questions regarding their coding.

Section B

- Transmyocardial laser revascularization (TMR)
- Pericardiectomy and excision of lesions of heart
- Repair/restoration of the heart or pericardium
- Coronary endarterectomy
- Pacemakers
- Internal Cardiac Defbrillators (ICDs)

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2) Non-Isolated CABG - *Principles*

1) Same surgery
2) Significantly increases risk
   - Cardiac
   - Vascular
   - Noncardiac

12) Race

Patient race or ethnicity

13) Gender

Patient gender (sex)

14) Patient Age

Patient age in years, at time of surgery. This should be calculated from the Date of Birth and the Date of Surgery, according to convention used in the USA (the number of birth date anniversaries reached by the date of surgery).

15) Height (cm)

Height of the patient in centimeters

16) Weight (kg)

Weight of the patient in kilograms

17) Status of the Procedure

The status that best describes the clinical status of the patient at the time of surgery.

- Emergent/Salvage
- Emergent
- Urgent
- Elective

(see clarification following)

17) Status of the Procedure

Emergent/Salvage: The patient is undergoing cardiopulmonary resuscitation en route to the operating room or prior to anesthesia induction.

17) Status of the Procedure

Emergent: The patient's clinical status includes any of the following:

- Ischemic dysfunction (any of the following):
  - Ongoing ischemia including rest angina despite maximal medical therapy (medical and/or intra-aortic balloon pump (IABP);
  - Acute evolving Myocardial Infarction within 24 hours before surgery; or
  - Pulmonary edema requiring intubation.
- Mechanical dysfunction (either of the following):
  - Shock with circulatory support; or
  - Shock without circulatory support.

17) Status of the Procedure

Urgent: ALL of the following conditions are met:
- Not elective status
- Not emergent status
- Procedure required during same hospitalization in order to minimize chance of further clinical deterioration.
- Worsening, sudden chest pain; congestive heart failure (CHF); acute myocardial infarction (AMI); coronary anatomy; IABP; unstable angina (USA) with intravenous nitroglycerin; rest angina, valve dysfunction; or aortic dissection.

17) Status of the Procedure

Elective: The patient's status has been stable in the days or weeks prior to the operation. The procedure could be deferred without increased risk of compromised cardiac outcome.

17) Status of the Procedure

Refers to patient's pre-operative condition (immediately before surgery)

- Doesn't measure operative risk but rather how expediently surgery must be performed
- Salvage is a rare event
- Rule of thumb

17) Status of the Procedure

Rule of thumb

- **Salvage -** no pulse on way to OR
- **Emergent -** *NOT* safe to wait
- **Urgent -** safe to wait *in hospital*
- **Elective -** safe to wait *at home*

18) Last Creatinine Level Pre-Op (mg/dl)

The most recent creatinine level prior to day of surgery. A creatinine level should be collected on all patients for consistency, even if they have no prior history.

18) Last Creatinine Level Pre-Op (mg/dl)

Code the most recent pre-operative value

19) Dialysis

The patient is on dialysis preoperatively

19) Dialysis

If patient is *currently* on dialysis, *not* if the patient has ever been on dialysis but isn't now

20) Diabetes

The patient has a history of diabetes, regardless of duration of disease or need for anti-diabetic agents.

20) Diabetes

STS definition is very easy to meet
- Insulin dependent, oral medications (NIDDM), or diet-controlled
- Adult Onset or type I

21) Peripheral Vascular Disease

The patient has a history at any time prior to surgery of Peripheral Vascular Disease, as indicated by claudication either with exertion or rest; amputation for arterial insufficiency; aorto-iliac occlusive disease reconstruction; peripheral vascular bypass surgery, angioplasty, or stent; documented abdominal aortic aneurysm (AAA), AAA repair, or stent; positive non-invasive testing documented. Excludes Cerebrovascular Disease.

21) Peripheral Vascular Disease

- $\geq$ 50% stenosis of aorta, iliac, femoral, popliteal
- Cerebrovascular disease is not included in peripheral vascular disease (see next data element)

22) Cerebrovascular Disease

The patient has a history at any time prior to surgery of Cerebrovascular Disease, documented by any one of the following: unresponsive coma > 24 hours; cerebro-vascular accident (CVA) (symptoms > 72 hours after onset); reversible ischemic neurological deficit (RIND) (recovery within 72 hours of onset); transient ischemic attack (TIA) (recovery within 24 hours of onset); non-invasive carotid test with > 75% occlusion; or prior carotid surgery.

22) Cerebrovascular Disease

Unresponsive coma > 24 hours
- CVA (symptoms >72 hours after onset)
- RIND (recovery within 72 hours)
- TIA (return within 24 hours)
- Non-invasive carotid test with >75% occlusion

23) Cerebrovascular Accident

Has a history, at any time prior to surgery, of a central neurologic deficit persisting more than 72 hours. (i.e. extremity weakness or loss of motion, loss of consciousness, loss of speech, field cuts). Chart documentation of a prior diagnosis of CVA or stroke is sufficient.

24) Cerebrovascular Accident Timing

Events occurring within two weeks of the surgical procedure are considered recent (<=2 weeks); all others are considered remote (>2 weeks).

25) Chronic Lung Disease

Specify if the patient has chronic lung disease and the severity level according to the following classification:

- No: No chronic lung disease present.
- Mild: Forced expiratory volume in one second (FEV1) 60% to 75% of predicted, and/or on chronic inhaled or oral bronchodilator therapy.
- Moderate: FEV1 50-59% of predicted, and/or on chronic steroid therapy aimed at lung disease.
- Severe: FEV1 <50% predicted, and/or room air partial pressure of oxygen (pO2) < 60 or room air partial pressure of carbon dioxide (pCO2) > 50.

25) Chronic Lung Disease

Don't code merely on the basis of a heavy smoking history or being labeled "COPD" in the chart *without other documentation* - i.e., STS wants you to confirm the diagnosis.

- Must be *chronic*
- Severity determined by PFTs or type of Rx

26) Hypertension

The patient has a diagnosis of hypertension, documented by one of the following:

- Documented history of hypertension diagnosed and treated with medication, diet and/or exercise.
- Blood pressure > 140 systolic or > 90 diastolic on at least 2 occasions.
- Currently on antihypertensive medication.

26) Hypertension

- History of HTN
- Blood pressure exceeding 140/90 on 2 occasions
- On antihypertensive medication

27) Immunosuppressive Rx

Patient has used any form of immunosuppressive therapy (i.e., systemic steroid therapy) within 30 days preceding the operative procedure. Does not include topical applications and inhalers.

27) Immunosuppressive Rx

Patients post organ transplant or with major rheumatologic conditions may be on such treatment, such as cyclosporine, azathioprine (Imuran), cyclophosamide (Cytoxan).

28) Hepatic Failure

The patient has cirrhosis, hepatic failure, acute hepatitis or "shock liver" and has a bilirubin greater than 2mg/dl and a serum albumin less than 3.5 grams/dl.

28) Hepatic Failure

Note: must have *BOTH*
1) a clinical history of cirrhosis, hepatic failure, acute hepatitis or "shock liver

AND

2) lab test abnormalities.

Lab test abnormality alone is not sufficient.

29) Arrhythmia

A preoperative arrhythmia present within two weeks of the procedure, by clinical documentation of any one of the following:

- Atrial fibrillation/flutter requiring medication.
- Heart block.
- Sustained Ventricular Tachycardia or Ventricular Fibrillation requiring cardioversion and/or intravenous amiodarone.

30) Arrhythmia Type

The type of arrhythmia present within two weeks of the procedure is:

- Sustained Ventricular Tachycardia or Ventricular Fibrillation requiring cardioversion and/or intravenous amiodarone.
- Heart Block.
- Atrial fibrillation/flutter requiring medication.

30) Arrhythmia Type

- If both VT/VF and another arrhythmia, code VT/VF.
- Within 2 wks of surgery.
- Sustained VT/VF is > 30 seconds or requires electrical cardioversion.
- NOT frequent PVC's (premature ventricular beats), bigeminy, or non-sustained ventricular tachycardia.

31) Myocardial Infarction

Patient was hospitalized for a myocardial infarction (MI) documented in the medical record. Two of the following four criteria are necessary:

- Prolonged (>20 minutes) typical chest pain not relieved by rest and/or nitrates.
- Enzyme level elevation: either (1) Creatine kinase-myocardial band (CK-MB) > 5% of total CPK; (2) Creatine kinase (CK) greater than 2x normal; (3) Lactate dehydrogenase (LDH) subtype 1 > LDH subtype 2; or (4) troponin > 0.2 micrograms/ml.
- Any wall motion abnormalities as documented by left ventriculogram, echocardiogram, MUGA Scan and or ejection fraction (EF) <45%.
- Serial electrocardiogram (at least two) showing changes from baseline or serially in ST-T and/or Q waves that are 0.03 seconds in width and/or > or + one third of the total QRS complex in two or more contiguous leads.

31) Myocardial Infarction

- Documentation of 4 criteria not always available, prior diagnosis OK, hospitalization not required
- Don't attempt to make diagnosis yourself
- If patient has *ever* had an MI
- We don't collect "Type of MI"

32) Myocardial Infarction Timing

Time period between the last documented myocardial infarction and the CABG surgery.

32) Myocardial Infarction Timing

- Collected as categorical variable
  - < = 6 hours
  - > 6 hours but < 24 hours
  - 1-7 days
  - 8-21 days
  - > 21 days
- Refers to the last documented infarction

33) Cardiogenic Shock

The patient, at the time of procedure, is in a clinical state of hypoperfusion according to either of the following criteria:

- Systolic blood pressure (BP) < 80 and/or Cardiac Index (CI) < 1.8 despite maximal treatment.
- Intravenous inotropes and/or intra-aortic balloon pump (IABP) necessary to maintain Systolic BP > 80 and/or CI > 1.8.

33) Cardiogenic Shock

Patient either
1) *Currently* has SBP <= 80 mmHg and/or CI <= 1.8, or
2) *Previously* met these criteria but now is on inotropes or IABP.

34) Angina

The patient has ever had angina pectoris.

34) Angina

Mark "yes" if the patient has *ever* had angina

35) Angina Type

The type of angina present within 24 hours prior to the CABG surgery is:
- Stable: Angina that is controlled by oral or transcutaneous medication.
- Unstable: The presence of on-going refractory (difficult, complicated, and/or unmanageable) ischemia which necessitates the increase or initiation of angina control therapies that may include: nitroglycerin drip, heparin drip, or intra-aortic balloon pump (IABP) placement. Types of unstable angina include: rest angina, new onset exertional angina of at least CCSC III in severity, recent acceleration in pattern and increase of one CCSC class to at least CCSC Class III, variant angina, non-Q wave myocardial infarction, and post-infarction angina.

35) Angina Type

- STS used to require IV NTG and ICU
- Patients with angina at rest who are subsequently diagnosed with a MI would have angina=Yes, type=unstable, CCS=class IV, MI=Yes.

35) Angina Type (Proposed Definition)

- Angina Type: Stable; Unstable.
- The type of angina present prior to the CABG surgery is:
- Stable: A history at any time prior to surgery of angina which does not meet unstable criteria below.
- Unstable: Patient has an episode of unstable angina within 24 hrs prior to surgery or which requires hospitalization continuously from the episode until surgery. To be unstable, angina must 1) require treatment with heparin (low molecular weight or unfractionated) unless heparing is contraindicated, AND 2) meet one or more of the following criteria: occurs at rest, new onset (within the past two weeks) of at least CCS class III in severity, recent increase (within the past two weeks) in severity by at least one CCS class to at least CCS class III, or angina associated with a rise in cardiac enzymes meeting criteria for myocardial infarction (see MI definition).

36) CCS Classification

Canadian Cardiovascular Society (CCS) Classification. This classification represents level of functional status related to frequency and intensity of angina. The CCS may not be the same as the NYHA classification for the same evaluation time period. Code the highest class leading to episode of hospitalization and/or intervention:

36) CCS Classification

0= No angina.

I = Ordinary physical activity, such as walking or climbing the stairs does not cause angina. Angina may occur with strenuous, rapid or prolonged exertion at work or recreation.

36) CCS Classification

II = There is a slight limitation of ordinary activity. Angina may occur with moderate activity such as walking or climbing stairs rapidly, walking uphill, walking or stair climbing after meals or in the cold, in the wind, or under emotional stress, or walking more than two blocks on the level, and climbing more than one flight of stairs at normal pace under normal conditions.
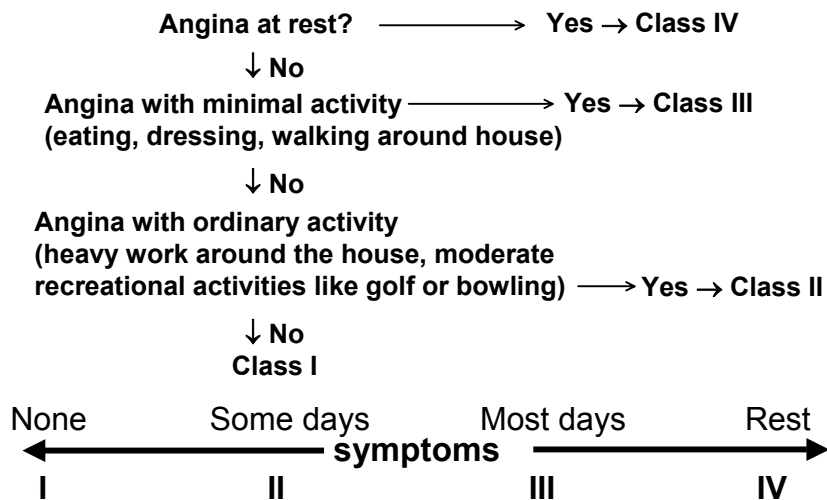
36) CCS Classification

III = There is marked limitation of ordinary physical activity. Angina may occur after walking one or two blocks on the level or climbing one flight of stairs under normal conditions at a normal pace.

IV = There is inability to carry on any physical activity without discomfort; angina may be present at rest.

36) CCS Classification

- Patients who have never had angina are assigned to "class" 0
- Note difference between coding in Roman numerals Vs. STS' "harvest coding"
- Highest *recent* class

36) CCS Classification

Angina at rest? ⎯⎯⎯⎯⎯⟶ Yes → Class IV

↓ No

Angina with minimal activity ⎯⎯⎯⟶ Yes → Class III
(eating, dressing, walking around house)

↓ No

Angina with ordinary activity
(heavy work around the house, moderate
recreational activities like golf or bowling) ⎯⟶ Yes → Class II

↓ No
Class I

None	Some days	Most days	Rest
←	**symptoms**		→
I	II	III	IV

37) Congestive Heart Failure

The patient had symptoms that occurred within 2 weeks prior to surgery. This does not include patients with chronic or stable non-symptomatic compensated congestive heart failure (CHF). The patient has one or more of the following:
- Paroxysmal nocturnal dyspnea (PND).
- Dyspnea on exertion (DOE) due to heart failure.
- Chest X-Ray (CXR) showing pulmonary congestion.
- Pedal edema or dyspnea and receiving diuretics or digoxin.

37) Congestive Heart Failure

This is a yes/no data element. Note that severity is measured by NYHA class within last two weeks

38) NYHA Classification

New York Heart Association (NYHA) Classification represents the overall functional status of the patient in relationship to both congestive heart failure and angina. The NYHA may not be the same as the CCS classification for the same evaluation period. Code the highest level leading to episode of hospitalization and/or procedure.

38) NYHA Classification

I = Patients with cardiac disease but without resulting limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea or anginal pain.

38) NYHA Classification

II = Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitations, dyspnea or anginal pain.

38) NYHA Classification

III = Patients with cardiac disease resulting in marked limitation of physical activity. They are comfortable at rest. Less than ordinary physical activity results in fatigue, palpitations, dyspnea, or anginal pain.
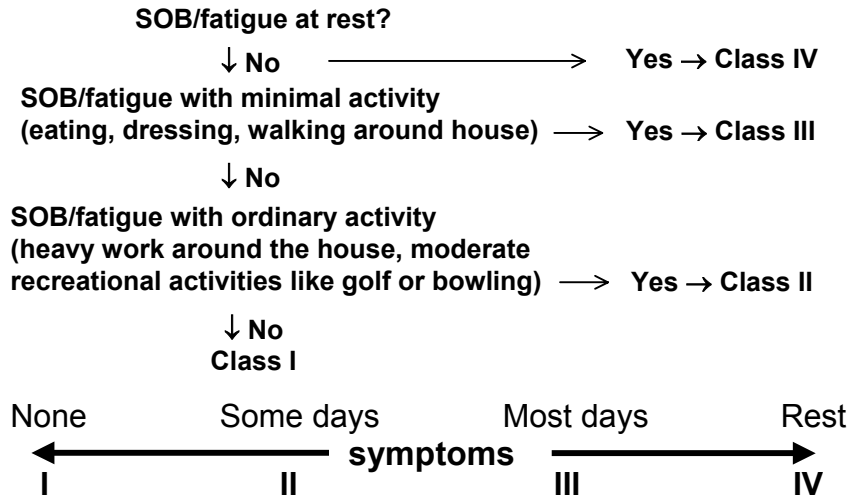
38) NYHA Classification

IV = Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of cardiac insufficiency or of the anginal syndrome may be present even at rest. If any physical activity is undertaken, discomfort is increased.

38) NYHA Classification

- Symptoms due to angina or heart failure
- No symptoms = class I
  (in contrast to class 0 for CCS)

38) NYHA Classification

SOB/fatigue at rest?

$\downarrow$ **No** $\longrightarrow$ **Yes $\rightarrow$ Class IV**

**SOB/fatigue with minimal activity
(eating, dressing, walking around house)** $\longrightarrow$ **Yes $\rightarrow$ Class III**

$\downarrow$ **No**

**SOB/fatigue with ordinary activity
(heavy work around the house, moderate
recreational activities like golf or bowling)** $\longrightarrow$ **Yes $\rightarrow$ Class II**

$\downarrow$ **No**
Class I

None	Some days	Most days	Rest

$\longleftarrow$ **symptoms** $\longrightarrow$

I	II	III	IV

39) Number of Prior Cardiac Operations Requiring Cardiopulmonary Bypass

Prior to this operation, the number of cardiac surgical operations performed on this patient utilizing cardio-pulmonary bypass.

39) Number of Prior Cardiac Operations Requiring Cardiopulmonary Bypass

- Cardiac surgeries include CABG, valve replacement/ repair, intracardiac repairs (ASD, VSD), ventricular aneurysmectomy, or surgery on the aortic arch.
- Do *not* record prior PTCA's, non-cardiac vascular surgeries such as abdominal aortic aneurysm repairs or fem-pop bypasses, or pacemaker/defibrillator implantations.

40) Number of Prior Cardiac Operations Without Cardiopulmonary Bypass

Prior to this operation, the number of cardiac surgical operations performed on this patient without cardiopulmonary bypass.

41) Prior PTCA
Including Balloon and/or Atherectomy

Percutaneous Transluminal Coronary Angioplasty (PTCA) and/or Coronary Atherectomy was done at any time prior to this surgical procedure (which may include during the current admission).

41) Prior PTCA
Including Balloon and/or Atherectomy

Includes coronary stenting

42) Interval
From Prior PTCA/Atherectomy to Surgery

The time between PTCA/Atherectomy and surgical repair of coronary occlusion:

- <= 6 hours
- >6 hours

43) Ejection Fraction

The percentage of blood emptied from the ventricle at the end of the contraction. Use the most recent determination prior to intervention.

43) Ejection Fraction

- Values: 5 – 90
- Important predictor. Make every effort to obtain.
- For "30 to 35%", enter "32" - no space for 32.5).
- Described qualitatively: normal = 65%, mildly reduced = 50%, moderately reduced = 35%, and severely reduced = 20%
- Calculated or quantified vs. visual estimates

44) Ejection Fraction Method

Method of obtaining ejection fraction measurement information:

- LV Gram: Left Ventriculogram.
- Radionuclide: MUGA Scan.
- Estimate: From other calculations, based upon available clinical data.
- ECHO: Echocardiogram.

44) Ejection Fraction Method

- "Estimate" not based on ventricular imaging unacceptable
- Try not to use TEEs

45) Left Main Disease (% stenosis)

Percentage of compromise of vessel diameter in any angiographic view.

45) Left Main Disease (% stenosis)

- CCORP collects actual % value
- STS collects as: LM > 50% (yes/no)
- Described qualitatively: "severe" = 80%, "moderate" = 35%, "mild" = 20%, "borderline" = 50%, "significant" = 70%.
- Terms such as plaquing or luminal irregularity should be considered mild.

46) Number of Diseased Coronary Vessels

The number of major coronary vessel systems (Left anterior descending (LAD) system, Circumflex system, and/or Right system) with >50% narrowing in any angiographic view. NOTE: Left main disease (>50%) is counted as TWO vessels (LAD and Circumflex). For example, left main and right coronary artery (RCA) would count as three total.

46) Number of Diseased Coronary Vessels

- Refers to number of *major* coronary arteries, i.e., coronary systems
- LM disease counts as TWO vessels
- The number may differ from the number of grafts placed

47) Mitral Insufficiency

Indicate if there is evidence of mitral valve regurgitation and if so, the severity level.

None = 0

Trivial, trace = 1+

Mild = 2+

Moderate = 3+

Severe = 4+

47) Mitral Insufficiency

- Use either ECHO or LVgram
- Try not to use TEEs
- If a range of MR is given, enter the higher value (e.g. for "2 to 3" enter "3").

48) Internal Mammary Artery(ies) Used as Grafts

Internal Mammary Artery(ies) (IMA) used for grafts, if any.

- Left IMA
- Right IMA
- Both IMAs
- No IMA

Not a risk adjuster

49) Cardiopulmonary Bypass Used

Use of cardiopulmonary bypass (CPB) at any time during the procedure.

Not a risk adjuster

50) Conversion to Cardiopulmonary Bypass

The patient needed to be placed on cardiopulmonary bypass (CPB) after the off-pump procedure was attempted.

Not a risk adjuster

51) Primary Incision

The primary incision used as the initial intention for treatment:

- Full Sternotomy
- Partial Sternotomy
- Transverse Sternotomy
- Right Vertical Parasternal
- Left Vertical Parasternal
- Right Anterior Thoracotomy
- Left Anterior Thoracotomy

- Posterolateral
- Thoracotomy
- Xiphoid
- Epigastric
- Subcostal

Not a risk adjuster

52) Cardioplegia

Cardioplegia was used.

Not a risk adjuster